

## CLAIMS

What is claimed is:

1. A method of cutting barbs on a suture, said method comprising the steps of:
  - 5 providing a suture;
  - providing a cutting blade;
  - creating a barb on said suture by the motion of the blade which takes into account a cutting action by the blade on the suture in three dimensions along x-y-  
10 z axes of the suture caused by blade geometry in conjunction with blade motion; and
  - providing a means for moving the blade to cause said cutting action to create the barb.
- 15 2. The method as described in claim 1 wherein the blade geometry causes a cutting action on the suture along two axes with the motion of the blade causing cutting along the remaining axes.
- 20 3. The method as described in claim 2 wherein the y-axis is a longitudinal axis of the suture, the x-axis is perpendicular to the longitudinal axis and the z-axis is at 90° with respect to the x-axis.
- 25 4. The method as described in claim 3 wherein the blade geometry causes a cutting action along the y and z axis with the blade motion causing a cutting action along the x-axis.
- 30 5. The method as described in claim 4 which includes providing a plurality of blades each of which creates a respective barb on the suture.

6. The method as described in claim 5 which includes the further step of twisting said suture along the y-axis prior to cutting.

5 7. The method as described in claim 1 wherein the blade geometry causes a cutting action on the suture along one axis with the motion of the blade causing cutting along the remaining two axes.

10 8. The method as described in claim 7 wherein the y-axis is a longitudinal axis of the suture, the x-axis is perpendicular to the longitudinal axis and the z-axis is at 90° with respect to the x-axis.

15 9. The method as described in claim 8 wherein the blade geometry causes a cutting action along the z-axis with the blade motion causing a cutting action along the x and y axes.

20 10. The method as described in claim 9 which includes providing a plurality of blades each of which creates a respective barb on the suture.

11. The method as described in claim 10 which  
25 includes the further step of twisting said suture along the y-axis prior to cutting.

12. The method as described in claim 1 wherein the y-axis is a longitudinal axis of the suture, the x-axis  
30 is perpendicular to the longitudinal axis and the z-axis is at 90° with respect to the x-axis.

13. The method as described in claim 12 wherein the motion of the blade causes cutting along the x-y-z axes.

5 14. The method as described in claim 13 which includes providing a plurality of blades each of which creates a respective barb on the suture.

15 15. The method as described in claim 14 which includes the further step of twisting said suture along the y-axis prior to cutting.

16. An apparatus for cutting barbs on a suture according to the method of claim 5, said apparatus  
15 comprising:

a cutting bed on which a suture is maintained in place, said suture having x-y-z axes wherein the y-axis is a longitudinal axis of the suture, the x-axis is perpendicular to the longitudinal axis and the z-axis is at 90° with respect to the x-axis;

means for causing a blade assembly to contact the suture in a predetermined manner; and

said blade assembly comprising a plurality of cutting blades having a geometry, and means for moving  
25 said cutting blades along the x-axis of the suture at a plurality of locations with the movement of the blades and the blades' geometry, producing a plurality of barbs on said suture.

30 17. An apparatus for cutting barbs on a suture according to the method of claim 6, said apparatus comprising:

1 a cutting bed on which a suture is maintained in  
place, said suture having x-y-z axes wherein the y-  
axis is a longitudinal axis of the suture, the x-axis  
is perpendicular to the longitudinal axis and the z-  
5 axis is at 90° with respect to the x-axis;

means for causing a blade assembly to contact the  
suture in a predetermined manner; and

10 said blade assembly comprising a plurality of  
cutting blades having a geometry, and means for moving  
said cutting blades along the x-axis of the suture at  
a plurality of locations with the movement of the  
blades and the blades' geometry, producing a plurality  
of barbs on said suture.

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18. An apparatus for cutting barbs on a suture  
according to the method of claim 10, said apparatus  
comprising:

20 a cutting bed on which a suture is maintained in  
place, said suture having x-y-z axes wherein the y-  
axis is a longitudinal axis of the suture, the x-axis  
is perpendicular to the longitudinal axis and the z-  
axis is at 90° with respect to the x-axis;

25 means for causing a blade assembly to contact the  
suture in a predetermined manner; and

30 said blade assembly comprising a plurality of  
cutting blades having a geometry, and means for moving  
said cutting blades in the x and y axes of the suture  
at a plurality of locations with the movement of the  
blades and the blades' geometry, producing a plurality  
of barbs on said suture.

19. An apparatus for cutting barbs on a suture according to the method of claim 11, said apparatus comprising:

5 a cutting bed on which a suture is maintained in place, said suture having x-y-z axes wherein the y-axis is a longitudinal axis of the suture, the x-axis is perpendicular to the longitudinal axis and the z-axis is at 90° with respect to the x-axis;

10 means for causing a blade assembly to contact the suture in a predetermined manner; and

15 said blade assembly comprising a plurality of cutting blades having a geometry, and means for moving said cutting blades in the x and y axes of the suture at a plurality of locations with the movement of the blades and the blades' geometry, producing a plurality of barbs on said suture.

20 20. An apparatus for cutting barbs on a suture according to the method of claim 15, said apparatus comprising:

25 a cutting bed on which a suture is maintained in place, said suture having x-y-z axes wherein the y-axis is a longitudinal axis of the suture, the x-axis is perpendicular to the longitudinal axis and the z-axis is at 90° with respect to the x-axis;

means for causing a blade assembly to contact the suture in a predetermined manner; and

30 said blade assembly comprising a plurality of cutting blades and means for moving said cutting blades in the x and y and z axes of the suture at a plurality of locations with the movement of the blades, producing a plurality of barbs on said suture.

21. An apparatus for cutting barbs on a suture according to the method of claim 16, said apparatus comprising:

5 a cutting bed on which a suture is maintained in place, said suture having x-y-z axes wherein the y-axis is a longitudinal axis of the suture, the x-axis is perpendicular to the longitudinal axis and the z-axis is at 90° with respect to the x-axis;

10 means for causing a blade assembly to contact the suture in a predetermined manner; and

15 said blade assembly comprising a plurality of cutting blades having a geometry, and means for moving said cutting blades in the x and y and z axes of the suture at a plurality of locations with the movement of the blades, producing a plurality of barbs on said suture.

22. A method of cutting a barb on a suture, said method comprising the steps of:

20 providing a suture having a longitudinal axis;  
twisting said suture along its longitudinal axis;  
and

cutting a barb on said suture when in its twisted state.

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23. The method in accordance with claim 22 which includes the further step of cutting a plurality of barbs on said suture when in its twisted state.